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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/574,863

04/06/2006

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12/01/2009

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EXAMINER

FOURSON III, GEORGE R

ART UNIT

PAPER NUMBER

2823

MAIL DATE

DELIVERY MODE

12/01/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/574,863 | Applicant(s) SASAKI ET AL. | |
| | Examiner George Fourson | Art Unit 2823 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 31,33,34,36,37 and 40-49 is/are pending in the application.
- 4a) Of the above claim(s) 49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 31,33,34,36,37 and 40-48 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>7/28/09</u> . | 6) <input type="checkbox"/> Other: _____ |

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 31,33,34,36,37,40,41,43-46 and 49 are rejected under 35 U.S.C. 102(a) as being anticipated by Maydan et al 2004/0166612 Yang 6653699 and further in view of Downey et al 2004/0235281.

Maydan et al '612 discloses plasma doping an SOI structure [0263] including co-implantation with helium [0293] wherein amorphization of the wafer surface occurs [0265]. The doping is followed by RTA which includes lamp heating or laser annealing [0322]. The reference discloses, as an alternative to co-implantation, preamorphization using Xe or Ar prior to plasma doping [0036] the reference does not disclose a plasma consisting of He for this purpose.

Yang discloses amorphization of silicon using a plasma of an inert element such as Ar, Xe or He.

It would have been obvious to one of ordinary skill in the art to combine the teachings of Maydan '612 with those of Yang to enable performing the disclosed amorphization step of Maydan '612 according to the teachings of Yang because in such a process the method of Yang would be used according to it's disclosed intended purpose and would therefor have reasonably been expected by one of ordinary skill in the art to yield the predictable results of forming the disclosed amorphized region of Maydan '612.

Maydan '612 does not disclose use of Xe lamp in the annealing step or provide guidance with respect to output of the lamp used for annealing with respect to wavelength.

Downey et al '281 discloses plasma doping of boron [0017] with preamorphization [0032] followed by activation annealing using Xe lamp having a substantial portion of it's output in the 200-1100 nm range. The reference discloses that the wavelength region desired may be chosen by use of an optical filter, use of a different optical source or multiple optical sources [0040-0041]. The reference exemplifies use of an optical source having a range of 300-800 nm [0040]. The reference discloses wavelength range used to be a result effective variable by stating that "different illumination wavelengths can provide different junction-forming performance results" [0066-0067]. There is overlap between the recited range and that disclosed by Downey et al (MPEP 2144.05). Further, one of ordinary skill in the art would have been led to the recited range in view of the guidance provided by Downey et al to obtain desired junction-forming performance results.

It would have been obvious to one of ordinary skill in the art to combine the teachings of Maydan et al '612 and Downey et al to enable performing the disclosed lamp annealing step of Maydan et al '612 according to the teachings of Downey et al because in such a process the method of Downey et al would be used according to it's disclosed intended purpose and would therefor have reasonably been expected by one of ordinary skill in the art to yield the predictable results of performing the disclosed

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lamp annealing step of Maydan et al. The resulting semiconductor would have the recited properties because the same materials are treated as in the instant invention.

Claims 42,47 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maydan '612 as applied to claims 31,33,34,36,37,40,41,43-46 and 49 above, and further in view of the following arguments.

The examiner takes official notice that use of silicon substrates having a (100) crystal orientation, strained Si substrates and glass substrates as SOI structures as recited was known prior to applicant's invention.

It would have been obvious to one of ordinary skill in the art to combine the known processes according to their known intended purposes with the process of Maydan '612 to enable providing the disclosed SOI substrate of Maydan '612 because in the process of the combination the known process would be employed according to their known intended purposes and would therefor reasonably have been expected to provide the predictable results of the disclosed substrate formation step of Maydan '612.

Applicant argues that advantages are obtained by using the recited wavelength. However, the advantages would also be obtained by following the teachings of the references relied on above because one of ordinary skill in the art would have been led to applicant's recited wavelengths as discussed above. Applicant has not established that there are unexpected results associated with the recited wavelength by pointing to

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objective evidence showing a sufficient number of comparisons at different wavelengths.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Fourson whose telephone number is (571)272-1860. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith, can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/George Fourson/
Primary Examiner, Art Unit 2823

GFourson
December 2, 2009